

## COMMUNICATION APPARATUS

### BACKGROUND OF THE INVENTION

#### Field of the Invention

5           The present invention relates to a facsimile apparatus which is connected to an analog public line (PSTN: Public Switched Telephone Network) or a digital public line (ISDN: Integrated Services Digital Network) and has a function to access a server through the Internet.

#### Related Background Art

10           In recent years, ISDN and the Internet have become remarkably widespread, whereby a home page is downloaded and an electronic mail (called an E-mail hereinafter) is sent/received by accessing a server from a terminal such as a personal computer (called a PC hereinafter) through the Internet.

15           Such a use of the Internet is not limited to the PC, i.e., an application by which an image to be sent by FAX (facsimile) is sent through the Internet has been proposed. For example, Japanese Patent Application Laid-Open No. 9-325924 (EP 0 812 100 A2) proposes that image data read out by a facsimile apparatus is converted to TIFF (Tagged Image File Format) data and sent as an E-mail.

20           A conventional method of sending an E-mail by using the facsimile apparatus will be explained

hereinafter.

First, a user sets an original (or a document sheet) to be sent on an original mounting board, and inputs a password to select a user name for which the user himself has been registered. Next, the user selects from a destination table a destination to which the original is to be sent, and depresses a start key after depressing an abbreviation number key or depresses a one-touch key.

A communication terminal apparatus T reads the original on the original mounting board one by one, causes a coder/decoder to once encode all the pages of the original in an MMR (Modified Modified READ) method to obtain G3-format image data, and then stores the obtained G3-format image data in an image memory. The communication terminal apparatus reads out the destination designated by an abbreviation number or a one-touch dial number, from the destination table. If an Internet E-mail address of the destination is not registered in the destination table, G3 or G4 facsimile sending is executed. Conversely, if the Internet E-mail address has been registered, a process to send an E-mail is executed.

When the image data is sent as an E-mail, the G3-format image data is subjected to TIFF conversion and then sent. In such a TIFF conversion process, header information of TIFF Class F is added to the head of the

G-3 format image data, thereby forming TIFF image data. Since the TIFF image data is binary data, this binary data is further converted into text data.

Then, a mail editing unit adds a header of the E-mail to the TIFF image data converted into the text data.

If the data of the E-mail format is completed, dial-up connection is executed to the Internet. If a telephone line to a provider is established, the communication terminal apparatus logs in according to a PAP (Password Authentication Protocol) procedure and sends the E-mail according to an SMTP (Simple Mail Transfer Protocol) procedure. After the E-mail was sent, the communication terminal apparatus logs off, whereby the telephone line is released.

Further, Japanese Patent Application Laid-Open No. 9-247334 proposes that it is automatically judged whether an original to be sent should be actually sent as an E-mail or facsimile. In this application, it is judged on the basis of a kind of number or symbol registered on an abbreviation dial key or a one-touch dial key whether such number or symbol represents an E-mail address or a facsimile number, and thus optimum sending is executed.

In the former conventional example as before-mentioned, when the sending process is executed by depressing the abbreviation number key or the one-touch

key, it is determined whether the data should be sent as the E-mail or the facsimile according to whether or not the E-mail address has been registered for the abbreviation number key or the one-touch key.

5           In the latter conventional example, when the sending process is executed by depressing a start key, it is determined whether the data should be sent as the E-mail or the facsimile on the basis of the kind of information registered on the abbreviation dial key or  
10          the one-touch dial key.

          In these examples, such a problem as follows has happened.

          Recently, a case where an individual has both an E-mail reception means and a facsimile reception means  
15          has increased. Therefore, even if information is sent to an identical destination, both a case to send the information by the E-mail and a case to send the information by the facsimile may arise according to a type of the information to be sent of a sending time.

20          In the conventional facsimile apparatus, in case of flexibly switching a sending method to the identical destination between the E-mail and the facsimile, it is necessary to allocate the E-mail and the facsimile respectively to different abbreviation dial keys or  
25          one-touch dial keys.

          As a result, it is necessary to prepare a lot of abbreviation number keys and/or one-touch keys, whereby

there has been a problem that the number of destinations capable of being registered decreases.

#### SUMMARY OF THE INVENTION

5           In the present invention, an object thereof is to solve the above-described conventional problem by providing in a facsimile apparatus a dedicated key to be depressed only in case of sending an E-mail, also enabling to register both an E-mail address and a  
10       facsimile number for one abbreviation dial number or one-touch dial number, and thus linking together and operating the dedicated key and a corresponding abbreviation dial key or the like.

#### 15       BRIEF DESCRIPTION OF THE DRAWINGS

          Fig. 1 is a block diagram showing the structure of a system to which the present invention is applied;

          Fig. 2 is a block diagram showing the structure of a facsimile apparatus 101 to which the present  
20       invention is applied;

          Fig. 3 is a diagram showing an operation unit of the facsimile apparatus 101 to which the present invention is applied;

          Fig. 4 is a flow chart showing an operation in a  
25       case where an E-mail address and a facsimile number are registered for an abbreviation number of facsimile;

          Fig. 5 is a flow chart showing the operation in

the case where the E-mail address and the facsimile number are registered for the abbreviation number of facsimile;

Fig. 6 is a flow chart showing an operation in a case where the facsimile apparatus executes E-mail sending of a read image; and

Fig. 7 is a table showing correspondence between keys and characters used in case of registering the abbreviation number.

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#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS (First Embodiment)

Hereinafter, the embodiment of the present invention will be explained in detail with reference to the attached drawings.

Fig. 1 is a block diagram showing the structure of a system according to the first embodiment of the present invention.

In Fig. 1, numeral 101 denotes a facsimile apparatus (FAX) to which the present invention is applied, numeral 102 denotes ISDN, numeral 103 denotes a server, numeral 104 denotes a personal computer (PC) on a destination, and numeral 105 denotes a facsimile apparatus (FAX) on the destination.

Fig. 2 is a block diagram showing the structure of the facsimile apparatus 101.

In Fig. 2, numeral 201 denotes a CPU (central

processing unit), numeral 202 denotes a data bus and an address bus, numeral 203 denotes a ROM, and numeral 204 denotes a RAM.

Numeral 205 denotes a facsimile (FAX) engine unit  
5 which is composed of a CPU (microcomputer), an image  
processing unit and the like. Information is exchanged  
between the facsimile engine unit 205 and the CPU 201  
through a serial communication interface. Numeral 206  
denotes a CPU for the facsimile engine unit, numeral  
10 207 denotes a RAM for the facsimile engine unit, and  
numerals 208 denote data buses for the facsimile engine  
unit. The facsimile engine unit 205 is connected to  
various devices 209 to 214 necessary to execute a  
facsimile operation and thus controls them. Numeral  
15 209 denotes a color scanner, numeral 210 denotes an  
operation panel, numeral 211 denotes a facsimile modem,  
numeral 212 denotes a handset, numeral 213 denotes a  
speaker, and numeral 214 denotes a holding melody  
generation unit. These devices 211 to 214 are  
20 controlled by the facsimile engine unit 205 and also  
connected to an analog switch 215, whereby analog data  
of audio or facsimile is connected to a public  
communication line through the analog switch 215.

Numeral 216 denotes a shared register which is  
25 used when the data is exchanged between the device  
connected to the data bus of the facsimile engine unit  
and the device connected to the data bus of the CPU

201.

Numeral 217 denotes a modular connector which connects ISDN (U point), numeral 218 denotes a DSU (Digital Service Unit) which converts the data communicated with an office exchange into a signal of TTL level. Numeral 219 denotes an ISDN interface which executes control based on Layers 1 to 3 of ISDN, and has a function to input/output the data via B channel of ISDN.

10 Numeral 220 denotes an HDLC (High-level Data Link Control) controller which executes a composite/decompose process regarding the data of HDLC format for ISDN.

15 Numeral 221 denotes a port switch which has a function to determine which of the HDLC controller 220 and the two ports of the analog switch 215 the data sent by B1 and B2 channels of ISDN is to be connected, under the control of the CPU 201.

20 Numerals 222 and 223 denote PCM (Pulse Code Modulation) codec each of which executes a digital/analog converting process between the port switch 221 and the analog switch 215.

25 Fig. 3 is a diagram showing an operation unit of the facsimile apparatus to which the present invention is applied. In Fig. 3, numeral 301 denotes a FAX sending ("FAX") key, numeral 302 denotes an E-mail sending ("E-MAIL") key, numeral 303 denotes an



abbreviation number ("ABBR") key, numeral 304 denotes a selection ("SELECT") key, numeral 305 denotes a dial key, and numeral 306 denotes a liquid crystal display.

5 Figs. 4 and 5 are flow charts showing an operation in a case where an E-mail address and a facsimile number are registered for an abbreviation number of facsimile.

10 Fig. 6 is a flow chart showing an operation in a case where the facsimile apparatus executes E-mail sending of a read image.

Fig. 7 is a table showing correspondence between keys and characters used when numbers and alphabet are registered for an abbreviation dial key or a one-touch dial key.

15 Hereinafter, an operation in a case where the facsimile apparatus reads image data and sends the read data as a file with an E-mail.

(method of registering sending destination's address and number)

20 In order to send the data to the Internet by using the facsimile apparatus according to the present invention, it is first necessary to set a telephone number of ISP (Internet Service Provider) having a server, and a user ID and a password to access the  
25 server.

After then, the E-mail address, the facsimile number and the like of the destination are registered

for the abbreviation dial keys or the like.

In the facsimile apparatus to which the present invention is applied, such setting as above can be executed in the same operation procedure as that for  
5 setting an ordinary abbreviation dial number or the like.

First, when the telephone number of the ISP is registered, after a "SET" key was depressed (S401), the "SELECT" key is depressed (S402). Since a screen to be  
10 displayed is changed every time the "SELECT" key is depressed, a "#" key is depressed when a message "REG OF ISP NUM" representing registration of the ISP number is displayed on the screen (S403). Thus, a message  
"ISP = " is displayed on the screen, and the telephone  
15 number is input. For example, if the telephone number of the ISP is "03-1234-1111", numerical keys representing "0312341111" are sequentially depressed (S404). If the telephone number is input, the CPU 201 stores ISP's number data in the RAM 204 (S405).

20 Next, the user ID is registered. Like the above registration of the ISP's telephone number, if the "SELECT" key is depressed after the "SET" key was depressed, since a message "REG OF USER ID" representing registration of the user ID is displayed,  
25 the "#" key is depressed (S406). Thus, a message "UID = " is displayed on the screen, and the user ID given by the ISP is input according to the correspondence

table shown in Fig. 7. If the user ID is input (S407), the CPU 201 stores user ID information in the RAM 204 (S408).

Similarly, the password is registered. If the  
5 "SELECT" key is depressed after the "SET" key was depressed, since a message "REG OF PWD" representing registration of the password is displayed, the "#" key is depressed (S409). Thus, a message "PWD = " is displayed on the screen, and the password given by the  
10 ISP is input according to the correspondence table shown in Fig. 7. If the password is input (S410), the CPU 201 stores the password in the RAM 204 (S411).

After the above settings end, registration of the E-mail address and the facsimile number for the  
15 abbreviation number is conducted.

First, the E-mail address is registered. For example, if an address "pat@canon.co.jp" is registered and set for an abbreviation number "1", the "SET", "ABBR" and "1" keys on the operation panel are  
20 depressed in due order (S412). Thus, since a message "\*1 = " is displayed on the liquid crystal display, whereby the following data can be input.

In order to input the above address, the dial keys and the "#" key are depressed by making a combination  
25 such as "7", "7", "7", "7", "7", "#", "2", "2", "2", "2", "#", "8", "8", "8", "8", "#", "0", "#", ..., "0", "0", "#", "5", "5", "5", "5", "#", "7", "7", "7", "7",

"7" and "#", whereby the address is set. At this stage, since the address "pat@canon.co.jp" is displayed on the display (S413), the "E-MAIL" key is depressed after confirming the displayed address. If the "E-MAIL" key is depressed (S414), the CPU 201 stores the input E-mail address at a predetermined address of the RAM 204 (S415), whereby the above address is registered as the E-mail address for the abbreviation number "1".

Next, the method of registering the facsimile number will be explained. For example, if a facsimile number "03-1234-2222" is registered, the "SET", "ABBR" and "1" keys are depressed in due order. Thus, since the message "\*1 = " is displayed on the liquid crystal display, then the numerals are sequentially input such that a number composed of "0", "3", "1", "2", "3", "4", "2", "2", "2" and "2" is displayed. At this stage, since a facsimile number "0312342222" is displayed on the display, the "FAX" key is depressed after confirming the displayed number. If the "FAX" key is depressed (S416), the CPU 201 stores the input facsimile number at a predetermined address of the RAM 204 (S417), whereby the above facsimile number is registered for the abbreviation number "1".

The numbers registered as above are stored respectively at different addresses on the memory, and the CPU 201 can read the stored number at an arbitrary time.

(method of sending data)

As above, it is assumed that an E-mail address "abc@canon.co.jp" and a facsimile number "03-123-4567" of a destination "A" have been registered for an abbreviation dial "1". In this case, a process to send a read image to the E-mail address or the facsimile apparatus of the destination "A" will be explained with reference to Fig. 6.

First, in case of sending the image data as the E-mail, in the state that an original document to be sent is being inserted into a feeder, the "ABBR" and "1" keys are sequentially depressed, and the "E-MAIL" key on the operation panel is then depressed.

If the CPU 206 detects the depression of the "E-MAIL" key (S501), the CPU 206 notifies the CPU 201 of E-mailing (S502). Then, the scanner 209 is started, whereby reading of the inserted original document starts (S503). The read image is stored in the RAM 207 (S504), and after the reading of all the images ended, data conversion such as MH (Modified Huffman) coding, MR (Modified READ) coding, MMR coding and the like is executed to the read image data by the facsimile engine unit 205 (S505).

Next, like the conventional manner, the CPU forms the E-mail data to be sent (S506).

If the data of the E-mail format is completed, dial-up connection is executed to the Internet. Then,

the CPU 201 instructs the ISDN interface to execute a sending process for the ISP of the previously set number (S507).

5 If the ISDN interface executes the sending process and is thus connected to the server on the side of the ISP (S508), a log-in procedure is executed. In the log-in procedure, the previously set user ID and the password are sent to the server according to the PAP (S509). When a response ACK is received from the  
10 server, the log-in procedure ends (S510).

Next, the CPU 201 reads, from the memory address at which the E-mail address for the abbreviation dial "1" has been stored, the E-mail address to which the data should be sent (S511). Then, the previously  
15 formed E-mail is sent to the read address according to the SMTP (S512). Concretely, an SMTP connection request command is formed, the image data is transferred from the RAM 207 to the RAM 204 through the shared register 216, the transferred image data is then  
20 converted by the HDLC controller 220 to have a predetermined format, and the thus obtained image data is sent to the server. If a response from the server is received, then the E-mail data is sent. If data sending ends (S513), an end command is sent, and the  
25 operation according to the SMTP ends if the server responds to the sent end command.

After the sending of the E-mail according to the

SMTP is completed, the apparatus logs out from the server (S514) and then disconnects the communication line, whereby a series of communication ends.

Next, in case of sending the image data as the facsimile data, in the state that the original document to be sent is being inserted into the feeder, the "ABBR" and "1" keys are sequentially depressed, and the "FAX" key on the operation panel is then depressed (S515).

10           If the CPU 206 detects the depression of the "FAX" key, the CPU 206 notifies the CPU 201 of facsimile sending (S516). Then, the scanner is started, whereby reading of the inserted original document starts (S517). The read image is stored in the RAM 207 of the facsimile engine unit 205 (S518), and after the reading of all the images ended, data conversion such as MH coding, MR coding, MMR coding and the like is executed to the read image data by the facsimile engine unit 205 (S519). The converted data is again stored in the RAM 207.

20           At this stage, the CPU 201 reads, from the memory address at which the facsimile number for the abbreviation dial "1" has been stored, the facsimile number to which the data should be sent (S520). Then, 25 the CPU 201 instructs the ISDN interface to execute a sending process (S521), and the ISDN interface sends the data to the previously read facsimile number.

If the destination's facsimile apparatus responds (S522), the sending of the converted image data is started. In the present embodiment, since the G3 facsimile sending is executed by using ISDN, the converted image data is modified by the facsimile modem on the basis of a G3 protocol (S523), the modified image data is subjected to digital coding by the PCM codec, and thereafter the encoded image data is sent by using the B1 channel of ISDN. If the sending of all the image data ends (S524), the G3 protocol ends, and the communication line is disconnected, whereby a series of communication processes ends.  
(effect of present embodiment)

As described above, both the E-mail address and the facsimile number are registered for the abbreviation number "1", and in the stage of sending the original document the "E-MAIL" key or the "FAX" key is depressed according to necessity, whereby there is a significant effect that the E-mail sending and the facsimile sending to the identical destination can be flexibly changed with each other without increasing the number of abbreviation dial keys and the like.  
(Second Embodiment)

The first embodiment premises that ISDN being the digital public communication line is used. However, the same effect as that in the first embodiment can be obtained by the same operation even in case of an



analog public communication line.

In this case, data modified by a data modem is used, in case of the E-mail sending, to send the E-mail to a server, and a digital conversion process by a PCM  
5 codec is unnecessary in case of facsimile sending. The present embodiment is different from the first embodiment in these points.

(Third Embodiment)

In the first embodiment, only the E-mail is sent  
10 in the E-mail sending. However, if a communication partner at a destination does not always use the E-mail, there is a case where it is delayed that the communication partner knows the E-mail reached.

Thus, it is also possible, by facsimile, to notify  
15 the communication partner of the sending of the E-mail. In this case, before and after the process to send the E-mail in the first embodiment, a facsimile document indicating that the E-mail has been sent can be sent to the facsimile number registered for the abbreviation  
20 number identical with that for which the E-mail address was registered.


(Fourth Embodiment)

In the first embodiment, only either the E-mail sending or the facsimile sending is executed. However,  
25 there is a case where it is impossible to judge whether the data should be sent by the E-mail or the facsimile.

In this case, by utilizing the fact that in ISDN

the communication can be executed with two channels at the same time, it is possible to send the same original document by both the E-mail and the facsimile at the same time.

5           Concretely, such an operation as above can be achieved by depressing the "E-MAIL" key and the "FAX" key simultaneously or sequentially, after depressing the "ABBR" key and the "1" key. By depressing these keys, the E-mail sending process as explained in the  
10 first embodiment is executed in B1 channel of ISDN, while the facsimile sending process is executed in B2 channel thereof.

 It should be noted that the operation is not limited to the above, i.e., the same effect as above  
15 can be obtained in a manner of providing a dedicated key for simultaneous data sending.

(Fifth Embodiment)

In the first embodiment, when the data is registered for the abbreviation dial key, it is  
20 determined, according to the kind of key depressed pursuant to the data input, whether the input data should be registered as the E-mail address or the facsimile number.

However, since specific symbols such as "@", "."  
25 and the like are used for the E-mail address, the same effect can be obtained even if it is judged, according to whether or not these symbols are included in the

input data, whether or not the input data represents the E-mail address.

As described above, according to the present invention, both the E-mail address and the facsimile number can be registered for the abbreviation dial key or the one-touch dial key provided on the facsimile apparatus, and the "E-MAIL" key and the "FAX" key are also provided, thereby linking together and operating these keys. Thus, in the state that the E-mail address and the facsimile number of the identical destination have been registered for the unique abbreviation dial number of the like, it is possible based on user's intention to determined whether the original document should be sent as the E-mail or the facsimile, whereby there is a significant effect that the E-mail sending and the facsimile sending can be easily executed without increasing the number of abbreviation dial keys and the like.

Further, by utilizing the fact that in ISDN the communication can be executed with two channels at the same time, it is possible to obtain a significant effect that the E-mail and the facsimile can be sent at the same time by simple management.